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Evaluating Cognitive Depth and Multimodality in Indonesian Elementary Textbooks Based on The PISA 2022 Reading Literacy Framework In The 2024 Revised Edition

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Abstract

Indonesia's persistently low performance in the Programme for International Student Assessment (PISA) underscores the urgent need to evaluate the cognitive quality of its primary instructional materials. This study evaluates the alignment of the 2024 Revised Edition of the Grade V Indonesian language textbook, Bergerak Bersama, with the PISA 2022 Reading Literacy Framework, focusing on cognitive depth and multimodal text integration. Employing a qualitative content analysis design, 25 evaluation instruments from Chapters 1 and 2 were coded according to PISA's three core cognitive processes: Access and Retrieve, Integrate and Interpret, and Reflect and Evaluate. Inter-rater reliability was established through a double-coding procedure, yielding an initial agreement rate of 88% and full consensus following deliberation. The findings reveal a structured yet imbalanced cognitive distribution: retrieval tasks (Access and Retrieve) constitute 48% of items, interpretative tasks (Integrate and Interpret) account for 32%, and evaluative tasks (Reflect and Evaluate) represent 20%. Qualitatively, the textbook demonstrates a meaningful shift toward multimodality through biographical comics and digitally linked infographics, aligning with PISA's emphasis on navigating diverse information formats. These findings suggest that the 2024 Revised Edition represents a substantive step toward greater alignment with international literacy benchmarks, though the predominance of lower-order tasks indicates room for further development. This study is limited to two representative chapters; future research should examine the full textbook. Findings carry significant implications for curriculum developers, instructional designers, and policymakers in developing educational contexts seeking to align national materials with global assessment standards.

1. INTRODUCTION

1.1 The Global and National Context of Literacy

Reading literacy constitutes a foundational competency for lifelong learning and full participation in modern society (OECD, 2023b). However, Indonesia's literacy performance remains a persistent and pressing concern within the international educational landscape. According to the latest results from the Programme for International Student Assessment (PISA) 2022, Indonesian students recorded a mean reading score of 359, substantially below the OECD average of 476 (OECD, 2023a). Notably, this figure represents a continuation of a declining trend across three consecutive PISA cycles, from 397 in 2015 to 371 in 2018, and 359 in 2022, consistently placing Indonesia within the bottom tier of all participating nations (Mullis & Martin, 2019). This persistent "literacy gap" is further compounded by a proficiency distribution problem: approximately 75% of Indonesian students fail to reach Level 2 proficiency, indicating a systemic struggle to move beyond retrieving explicit information toward higher-order skills such as critical reflection and evaluation (OECD, 2023a)).

1.2 The Role of Textbooks in Instructional Transformation

In response to this persistent challenge, the Indonesian government introduced the Kurikulum Merdeka (Merdeka Curriculum), which emphasizes essential competencies, student-centred learning, and character building (Saa, 2024; Sukmayadi & Yahya, 2020). This curriculum explicitly aligns national education goals with international competency frameworks, granting greater autonomy to schools while equipping educators with tools to foster reading, numeracy, and higher-order thinking (Hunaepi & Suharta, 2024). Within this framework, national textbooks serve as the primary vehicle for instructional delivery and pedagogical transformation. As noted by Badmus & Jita, (2025), Cruz (2011), and Fagbola & Onasanya (2020), textbooks in developing educational contexts often function as the de facto curriculum, directly determining the cognitive depth of classroom activities. Therefore, the quality and alignment of these materials with global literacy standards are of paramount importance. The 2024 Revised Edition of the Grade V textbook, Bergerak Bersama (Lestari GF, 2024), represents the most recent effort by the Ministry of Education to refine these instructional tools to meet contemporary demands.

1.3 The Research Gap

Prior research on Indonesian textbooks has frequently identified a "cognitive imbalance," wherein evaluation instruments are predominantly skewed toward literal comprehension, or the Access and Retrieve level (Hotimah & Yulifar, 2020; Pamungkas et al., 2025; Renette et al., 2021; Susrawan et al., 2024). Such materials often fail to provide the necessary pedagogical scaffolding for students to develop the evaluative skills tested in PISA assessments. This pattern persists even under the Merdeka Curriculum: a content analysis of the Merdeka Curriculum English textbook for Indonesian high school found that the majority of reading comprehension tasks focused on lower-order thinking, with only a small proportion requiring analysis or creation, indicating a discrepancy between the curriculum's HOTS aspirations and its textbook realization (Erdiana & Panjaitan, 2023; Surono et al., 2022). Despite this pattern being documented across multiple subject areas and grade levels, there remains a notable dearth of empirical evidence concerning how the 2024 Revised Edition of the Indonesian language textbook specifically addresses these cognitive gaps at the elementary level — a gap this study seeks to address.

1.4 Objectives of the Study

This study aims to evaluate the alignment of the Grade V Indonesian language textbook, Bergerak Bersama (2024 Revised Edition), with the PISA 2022 Reading Literacy Framework. Specifically, it analyzes: (1) the distribution of cognitive levels across evaluation instruments based on PISA's three core processes, Access and Retrieve, Integrate and Interpret, and Reflect and Evaluate; and (2) the integration of multimodal texts as a mechanism for broadening literacy task complexity. By examining this recent edition through a rigorous content analysis lens, the research contributes to the broader discourse on how developing nations can strategically redesign primary education materials to address

global assessment challenges. These findings are expected to provide actionable insights for curriculum designers, textbook authors, and policymakers striving to enhance national literacy outcomes.

2. METHODOLOGY

2.1 Research Design

This study employs a qualitative content analysis approach to evaluate the alignment of the 2024 Revised Edition of the Grade V Indonesian language textbook with international literacy standards. Content analysis was selected as it allows for a systematic and objective inference from textual materials by identifying specific characteristics of messages within instructional content (Krippendorff, 2013). This method is widely recognized as appropriate for evaluating the cognitive demands embedded in educational documents, as it enables researchers to move beyond surface-level description toward interpretive conclusions about pedagogical intent and alignment (Nussbaum, 2005; Xie, 2024).

2.2 Data Source and Unit of Analysis

The primary data source is the national textbook for Grade V, titled Bergerak Bersama (2024 Revised Edition), published by the Ministry of Education, Culture, Research, and Technology of Indonesia (Lestari GF, 2024). The analysis focuses on Chapters 1 and 2, which were selected through a purposive sampling strategy based on three explicit criteria. First, the two chapters represent structurally distinct text types, narrative (Chapter 1) and informative/biographical (Chapter 2), enabling the examination of cognitive task distribution across the two predominant text genres present in the full textbook. Second, these chapters appear at the foundational stage of the textbook and are therefore designed to establish the overarching pedagogical orientation of the entire volume, making them particularly informative for alignment analysis (G. Kaur, 2019; Pattison, 2017). Third, consistent with purposive sampling principles in qualitative inquiry, the selected units were identified as information-rich cases most likely to reveal the cognitive design logic of the instructional materials (Creswell and Poth, 2023). The units of analysis consist of all evaluation instruments within these chapters, including end-of-text comprehension questions, discussion prompts, and creative tasks, totaling 25 distinct instructional items.

2.3 Research Instrument

To ensure a rigorous evaluation, the research instrument was adapted from the PISA 2022 Reading Literacy Framework (OECD, 2023b). Instructional items were coded into three hierarchical cognitive processes:

1. Access and Retrieve (AR): Tasks requiring the location and retrieval of explicit information within the text.

2. Integrate and Interpret (II): Tasks requiring the processing of information to form internal consistency or identify implicit meanings.
3. Reflect and Evaluate (RE): Tasks requiring the connection of the text to outside knowledge or the evaluation of the text's form and content.

Before the coding phase, the instrument underwent a content validity procedure through expert judgment to ensure that the operational definitions of each cognitive category were sufficiently clear, coherent, and relevant for application to elementary-level instructional materials. Content validation through expert judgment is defined as an informed opinion from individuals with recognized expertise in the field, who evaluate an instrument's items in terms of their relevance, clarity, coherence, and sufficiency (Bernal-García et al., 2020; Roebianto et al., 2023). Two expert validators, specialists in language education and reading literacy assessment, independently reviewed each of the three category descriptors and their corresponding coding rubrics. Content validity is determined based on the judgment of a panel of professional and field experts, who evaluate the level of importance and representativeness of each item in relation to the construct being measured (Ikhsanudin & Subali, 2018; Muliana et al., 2020). Following the expert review, minor clarifications were made to the boundary definitions between the Integrate and Interpret and Reflect and Evaluate categories — an area subsequently confirmed to present the primary source of intercoder ambiguity — before the instrument was finalized for use.

2.4 Coding Procedure and Reliability

To mitigate researcher bias and ensure the technical soundness required for high-impact publication, a double-coding procedure was implemented. Two independent coders,specialists in language education, categorized each of the 25 instructional tasks according to the validated PISA framework instrument:

1. Initial Agreement: The coders achieved an initial agreement rate of 88%.
2. Consensus Building: Following the initial coding, a structured discussion was held to resolve discrepancies, primarily concentrated in tasks bridging the Integrate and Interpret and Reflect and Evaluate levels, consistent with the boundary ambiguity identified during the expert validation stage.
3. Final Reliability: A 100% consensus was reached after deliberation, ensuring the robustness of the data presented in the results section.

This dual-stage validation process, combining prior expert judgment of the instrument with post-coding intercoder consensus, addresses two distinct threats to internal validity: instrument ambiguity and coder subjectivity (Krippendorff, 2013).

2.5 Data Analysis

The categorized data were analyzed through frequency distribution and percentage calculations to visualize the cognitive depth profile of the textbook's evaluation instruments. Furthermore, a qualitative thematic analysis was conducted to examine the presence and pedagogical function of multimodal elements, including comics, infographics, and digitally linked content, and their role in broadening the cognitive and literacy demands placed on students, as defined by the PISA 2022 framework (OECD, 2023b).

3. RESULTS

This section presents the findings from the content analysis of the Bergerak Bersama (2024 Revised Edition) textbook, focusing on the distribution of cognitive levels and the qualitative characteristics of the reading tasks.

3.1 Quantitative Distribution of PISA Cognitive Levels

The analysis of instructional tasks across the selected chapters reveals a structured distribution of cognitive demands. Table 1 summarizes the categorization of these tasks based on the PISA 2022 Reading Literacy Framework.

Table 1. Distribution of Cognitive Processes in Evaluation Instruments

Cognitive Process	Frequency (f)	Percentage (%)	Typical Instructional Task
Access and Retrieve (AR)	12	48%	"Identify the names of the twin characters in the story." (Chapter 1)
Integrate and Interpret (II)	8	32%	"Compare and contrast the personalities of the two protagonists." (Chapter 1)
Reflect and Evaluate (RE)	5	20%	"In your opinion, how would history change if Kartini never had access to books?" (Chapter 2)
Total	25	100%	

The data indicates that while foundational literacy, represented by the Access and Retrieve level, still constitutes nearly half of the tasks (48%), there is a significant integration of higher-order tasks. Specifically, the Reflect and Evaluate category (20%) signifies a meaningful step in encouraging students to engage in critical and evaluative thinking.

3.2 Qualitative Attributes of Literacy Tasks

Beyond numerical distribution, the 2024 edition demonstrates a qualitative shift toward **multimodality**. For instance, Chapter 2 utilizes a combination of traditional prose, biographical comics ("Kotak Baca

Kartini"), and digital-linked infographics. This multimodal approach requires students to navigate diverse text formats, a core competency emphasized in the PISA 2022 framework.

4. DISCUSSION

The findings of this study offer substantive insights into the cognitive architecture and multimodal design of the 2024 Revised Edition of the Grade V Indonesian language textbook. The following discussion interprets these findings in relation to global literacy standards, theoretical frameworks, and the practical realities of curriculum implementation in Indonesia.

4.1 Bridging the Cognitive Gap: From Literal to Critical

The 20% allocation for Reflect and Evaluate (RE) tasks represents a deliberate and meaningful step toward addressing Indonesia's historically low performance in critical reading. Previous studies on Indonesian curricula consistently highlighted an over-reliance on literal comprehension tasks (Nurkamto et al., 2021; Sari et al., 2020), a pattern that rendered the pedagogical scaffolding of prior textbooks insufficient for developing the evaluative competencies assessed in PISA. By incorporating hypothetical and evaluative questions, such as prompting students to reflect on a historical figure's motivations, the 2024 edition demonstrates an intentional effort to cultivate metacognitive awareness among learners.

This shift is theoretically significant. PISA assesses students' abilities to use their knowledge in real-life contexts, requiring not merely the retrieval of information but the application of higher-order thinking skills such as reasoning, analysis, and creative problem-solving (OECD, 2023b). The progression from 48% (AR) to 32% (II) to 20% (RE) in the 2024 edition reflects a pyramidal cognitive design that, while still foundationally oriented, deliberately exposes students to evaluative demands at a level not previously documented in Indonesian elementary-level textbook research. However, it is important to note that PISA assessments at higher proficiency levels demand that Reflect and Evaluate tasks constitute a substantially larger proportion of cognitive demand — suggesting that further revision cycles should continue to rebalance this distribution upward.

4.2 Multimodality and 21st-Century Literacy

The integration of visual narratives, biographical comics, and digital-linked infographics in the 2024 edition reflects a modernized conception of what it means to be literate in the 21st century. PISA 2022 defines reading not simply as the decoding of prose, but as the ability to navigate a complex and diverse information ecosystem — one in which multimodal texts are increasingly the norm rather than the exception (OECD, 2023b). The textbook's incorporation of these formats serves as a **pedagogical scaffold** that simultaneously reduces the cognitive load for young learners while exposing them to the very text types they will encounter in international assessments.

This design logic is well-supported by the Dual Coding Theory (Alyahya, 2019; Otti et al., 2025; Paivio, 1991), which posits that the simultaneous encoding of verbal and visual information in working memory enhances both depth of comprehension and long-term retention. Recent syntheses of multimodal pedagogy research confirm that instruction integrating multimodal texts — including comics, infographics, and digital media — promotes language and literacy development, enhances engagement, and develops students' capacity to read, view, and design across diverse modes of communication (Karjagdi Çolak, 2024; Reid & Moses, 2022). The 2024 edition's integration of digitally linked content further signals a forward-looking alignment with the Learning in the Digital World domain announced for PISA 2025, indicating that Indonesian curriculum designers are beginning to anticipate — rather than merely respond to — shifts in international assessment priorities (OECD, 2023b).

4.3 Implementation Challenges and the Centrality of Teacher Mediation

While the 2024 edition provides a sophisticated instructional framework, its ultimate effectiveness remains contingent upon the quality of classroom execution. Teachers function as the vital link between policy design and classroom practice; the success of any educational reform hinges on teachers' capacity to interpret, adapt, and implement new approaches with genuine understanding and ownership (K. Kaur & Lim-Ratnam, 2023; Ohi, 2008). This challenge is particularly acute in the Indonesian context, where significant variation persists in teachers' understanding and application of HOTS-oriented pedagogy.

Drawing a parallel to Alfelaij, (2016) and Alhashem, (2022) in the Kuwaiti context, the effectiveness of any educational tool is mediated by the quality of instruction. In Indonesia, most teachers demonstrate a basic conceptual understanding of HOTS, yet many continue to experience significant difficulties in translating these principles into effective classroom practices, particularly in designing and facilitating tasks that require students to reason at the analytical and evaluative levels (Lilo Adi Sucipto et al., 2025; Retnawati et al., 2018). This implementation gap means that the sophisticated Reflection and Discussion segments embedded in the 2024 edition risk being reduced to procedural exercises unless teachers actively mediate the higher-order thinking demands these tasks are designed to elicit. Research on teacher professional development programs in Indonesia confirms that structured, collaborative, and context-responsive training initiatives have demonstrated significant benefits for improving instructional quality and classroom learning outcomes (Handayani et al., 2023a; Robertson et al., 2018). Policymakers should therefore ensure that the cognitive ambitions embedded in the 2024 Revised Edition are matched by targeted professional development that explicitly addresses HOTS facilitation strategies, multimodal text instruction, and formative assessment aligned with PISA-level cognitive demands.

4.4 Limitations

This study acknowledges several limitations that should be considered when interpreting its findings. First, the analysis is confined to Chapters 1 and 2 of the Bergerak Bersama 2024 Revised Edition, totaling 25 instructional items. While these chapters were selected purposively as representative of the textbook's foundational pedagogical orientation, the findings cannot be assumed to reflect the full cognitive profile of the entire volume. Future research should extend the analysis to all chapters to provide a more comprehensive evaluation.

Second, the study relies on content analysis as its primary methodology, which, by design, captures the intended cognitive demands of tasks as written rather than the actual cognitive processes enacted by students or mediated by teachers in classroom settings. The gap between textbook design and classroom implementation is a well-documented phenomenon in curriculum research (Handayani et al., 2023b; Niaz, 2015), and the present findings should therefore be interpreted as an evaluation of designed rather than enacted curriculum.

Third, while inter-rater reliability was established through a double-coding procedure and expert validation of the instrument, the coding of cognitive levels involves an inherent degree of interpretive judgment. Future studies employing larger coding teams and quantitative reliability indices (e.g., Cohen's kappa) would further strengthen the methodological rigor of similar analyses.

Finally, the study does not examine student outcomes, meaning it cannot establish causal claims about the relationship between the textbook's cognitive design and actual improvements in reading literacy performance. Longitudinal and quasi-experimental designs tracking student achievement before and after textbook adoption would be necessary to address this question.

5. CONCLUSION

This study has systematically evaluated the cognitive depth and multimodal design of the 2024 Revised Edition of the Grade V Indonesian language textbook, Bergerak Bersama, in relation to the PISA 2022 Reading Literacy Framework. The findings lead to several key conclusions.

First, the 2024 Revised Edition demonstrates a substantive pedagogical advancement by rebalancing the distribution of cognitive demands. While foundational comprehension remains a core element, the inclusion of 20% Reflect and Evaluate tasks indicates a deliberate move toward fostering higher-order thinking skills (HOTS). This shift is essential for bridging the gap between national instructional practices and international assessment standards, and is consistent with the broader PISA-driven curriculum reform trajectory observed across multiple national educational systems globally (Hannah et al., 2022; Zioga & Desli, 2025).

Second, the integration of multimodal texts, ranging from biographical comics to digital-linked infographics, represents a modernized approach to literacy instruction. By exposing students to diverse

information formats, the textbook effectively mirrors the complexity of 21st-century reading environments as defined by the PISA framework. The OECD has announced that PISA 2025 will include Learning in the Digital World as its innovative domain, measuring students' capacity to engage in iterative knowledge building using digital tools (OECD, 2023b). This further underscores the strategic relevance of the 2024 edition's multimodal orientation, positioning it as a forward-looking instructional tool rather than merely a reactive response to past assessment results.

However, the cognitive alignment documented in this textbook is a necessary but not sufficient condition for improving national literacy outcomes. The success of these enhanced materials is inherently linked to teacher competency and classroom execution. As this study has argued, the sophisticated tasks embedded in the 2024 edition require active teacher mediation to ensure they are not reduced to rote exercises. PISA evidence from comparable developing-country contexts consistently shows that teaching quality and classroom interaction are stronger predictors of reading achievement gains than curriculum materials alone (Cai et al., 2024; Nilsen et al., 2025; Qiu & Liu, 2024).

In conclusion, the 2024 Revised Edition of the Grade V textbook marks a promising and strategically coherent response to Indonesia's PISA challenges. It provides a more cognitively diverse and contemporary learning tool that, if implemented effectively, could serve as a catalyst for elevating national literacy proficiency. Future research should focus on longitudinal studies to measure the direct impact of these revised materials on student performance in national and international assessments, and on comparative analyses of the full textbook to establish a more complete picture of its cognitive distribution across the academic year.

6. RECOMMENDATIONS

6.1 For Curriculum Developers

Increase the proportion and complexity of evaluative tasks in future textbook revisions, specifically by introducing "multiple-text" scenarios where students must synthesize and compare information from two or more sources, a key feature of high-level PISA tasks and a competency explicitly assessed in PISA 2022 (OECD, 2023b). The OECD has also announced that PISA 2029 will return to reading as its focal domain, with a Media and Artificial Intelligence Literacy component, a development that further underscores the urgency of building evaluative and multimodal literacy skills from the elementary level. Additionally, the current 20% Reflect and Evaluate allocation should be progressively increased in future editions to better approximate the cognitive demands of upper-level PISA reading proficiency.

6.2 For Practitioners

Teachers should be encouraged and supported to utilize the Reflection and Discussion segments of the book as central learning activities rather than optional supplements, focusing on the process of reasoning rather than just the final answer. Instructional coaching, peer observation, and lesson study

models have been shown to be particularly effective in improving instructional quality and student learning outcomes in Indonesian elementary schools (Manasa et al., 2026; Subadi et al., 2019; Tas et al., 2018).

6.3 For Policymakers

Align teacher professional development programs with the cognitive demands of the 2024 Revised Edition to ensure that the higher-order thinking skills (HOTS) embedded in the textbook are fully realized in the classroom. Professional development initiatives should incorporate explicit training in PISA-aligned assessment literacy, multimodal text instruction, and formative assessment strategies. Furthermore, policymakers are encouraged to commission longitudinal evaluations of textbook impact on student literacy outcomes to generate the evidence base needed to guide future curriculum revision cycles (Falisse et al., 2024; Frölich & Michaelowa, 2011; van den Ham & Heinze, 2018).

Declarations

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Ethics Approval and Consent to Participate

Not applicable. This study does not involve human participants, human data, or any form of direct interaction with individuals. The research is based solely on qualitative content analysis of a publicly available textbook.

Consent to Participate

Not applicable. No human participants were involved in this study.

Consent for Publication

Not applicable. The study does not include any individual person’s data in any form.

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